



## *Hair Styling Appliances*

In hair styling, heat is applied to soften the protein structure of the hair and make the hair receptive to new curl formation. Correctly applied, heat is safe, fast, efficient and it creates long-lasting curls. But heat styling equipment that is defective or improperly used can cause cracks, blisters or pinching of hair fiber.

Redken Laboratories, Canoga Park, California has been conducting hair care research for more than 20 years. Seeking answers to the specific problems of heat styling, Redken made a comprehensive investigation of hair's reaction to heat and how heat damage might be eliminated by development of advanced styling equipment. This effort led to formation of a new Redken division—Styling Research Company, also of Canoga Park—and a new line of styling appliances.

A key tool of Redken's research program was an instrument called a thermograph, a heat-sensing device originally developed by Hughes Aircraft Company under U.S. Army and NASA funding. The Army sponsored the work as part of its missile guidance research; NASA sponsored a demonstration project designed to explore

civil applications of the system under the NASA Technology Utilization Program.

Called the Probeye® Thermal Video System, or TVS, the Hughes system consists of a portable, tripod mounted infrared scanner that detects the various degrees of heat emitted by an object, and a TV monitor on which the results are displayed in colors representing the different temperatures detected. At upper left is the original version of the Probeye, shown examining the heat levels in an industrial boiler complex. The center photo shows the current Probeye Thermal Video System, produced for a number of industrial heat sensing applications by Hughes Industrial Products Division, Carlsbad, California; it is built in three models, each of which combines the image processor and the display equipment in one compact unit.

Redken Laboratories bought one of the early models from Hughes and used it in development of its hair styling equipment. In the upper right photo, the Probeye system is being used to test one of Styling Research Company's hair dryers; the monitor shows the heat being applied evenly and efficiently. At right center is a

® Probeye is a registered trademark of Hughes Aircraft Company.



thermographic view of the dryer itself, with temperatures at various parts of the appliance indicated by the coded colors; the thermograph shows a proper heating pattern in the barrel and also indicates—by the low temperature readings for handle and housing—that the appliance is properly insulated. Although the TVS is used primarily for testing new appliances, Redken has employed it in other research, for example, to differentiate facial surface temperatures (bottom); such research is aimed at detecting how moisturizers hold heat in the skin and how astringents cool off the skin.

The Styling Research Company line that emerged from Redken's research includes the blow dryer, two types of curling irons and a curling brush, all designed for professional use. The irons and the brush do not employ the conventional coil heating element; instead they have a unique ceramic heating bar—derived from space and medical technology—that eliminates troublesome hot spots because heat is dispersed evenly along the barrel. The curling brush has plastic teeth designed to glide through hair with minimal friction to prevent mechanical damage to hair fibers. The band heater in the blow dryer is positioned at the front of the barrel to bring the source of heat as close as possible to the hair for more efficient delivery and greater control.